UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION

COLLISION COMMUNICATIONS, INC., Plaintiff, v. NOKIA CORPORATION, NOKIA SOLUTIONS AND NETWORKS OY, and NOKIA OF AMERICA CORPORATION, Defendants.	No. 2:21-CV-308-JRG (Lead Case) **Jury Trial Demanded**
COLLISION COMMUNICATIONS, INC., Plaintiff, v. TELEFONAKTIEBOLAGET LM ERICSSON and ERICSSON INC., Defendants.	No. 2:21-CV-327-JRG (Member Case) **Jury Trial Demanded**

PLAINTIFF COLLISION COMMUNICATIONS, INC.'S
OPENING CLAIM CONSTRUCTION BRIEF

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2	’492	U.S. Patent No. 7,593,492 to Lande
3	’851	U.S. Patent No. 7,724,851 to Learned et al.
4	’479	U.S. Patent No. 9,888,479 to Farkas et al.
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16	Am. Heritage Dictionary	The American Heritage College Dictionary (4th ed. 2002) (excerpts)
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	Collision	Plaintiff Collision Communications, Inc.
	Nokia	Defendants Nokia Corporation, Nokia Solutions and Networks Oy, and Nokia of America Corporation

	Ericsson	Defendants Telefonaktiebolaget LM Ericsson and Ericsson Inc.
	Defendants	Ericsson collectively with Nokia
	MUD	Multi-User Detection
	POSITA	Person of ordinary skill in the art
	AAPA	Applicant admitted prior art

* All emphasis in this brief added unless otherwise noted.

Plaintiff Collision submits this brief for the 13 disputed terms in five of the six patents asserted against Defendants: the '851, '479, '561, '620, and '492 patents.[1] Collision respectfully requests the Court adopt its proposed constructions, which are consistent with the intrinsic evidence, including the language of the claims as read in light of the specification and prosecution histories, and with the understanding of a POSITA. Defendants, in contrast: ignore the well-established principle that claim terms are to be accorded their ordinary meaning unless the inventors clearly acted as their own "lexicographer" or disavowed claim scope; ignore algorithms set forth in the specification in arguing that certain means-plus-function claim limitations are indefinite; and unnecessarily complicate simple, well-understood terms, contravening the well-established principle that claim construction should clarify, not obfuscate.

I. THE '851 PATENT

The '851 patent is generally directed to increasing the number of users capable of communicating over an interference-heavy cellular network by implementing a novel multi-user detection ("MUD") process. A conventional cellular base station has signal collectors (antennas) that may utilize well-known "beamforming" techniques to separate the signals received from different users before engaging in multi-user detection. The '851 patent, in contrast, uses multiple collectors that separately collect signals received from different users. Rather than using beamforming on the received signals before the MUD process, the patent describes processing those signals in parameter estimation units and combining the outputs from the parameter estimation units into a stacked signal before engaging in a MUD process. This novel process increases throughput and allows for more network users. '851 at Abstract, 1:14-23, 2:50-4:25.

[1] Collision alleges that Nokia infringes these patents plus the '071 patent and alleges that Ericsson infringes just the '620, '492, '851, and '071 patents. No parties have identified any disputed terms for construction from the '071 patent.

A. The "multi-user detection" terms (cls. 1, 2, 3, 9, 10, 11)[2]

Collision's Proposed Construction	Defendants' Proposed Construction
"multiuser detection unit that receives signals that are not beamformed"	"multiuser detection unit that receives signals with all interference intact that are not beamformed and that are not spatially nulled"

The parties agree that the claimed MUD receives signals that are not "beamformed," but dispute whether the signals received by the MUD must also "not [be] spatially nulled" and have "all interference intact." Collision is correct that these additional characteristics are not required.

Consistent with both parties' constructions, the specification discloses that the MUD does not receive signals that are beamformed. A base station implementing the inventions of the '851 patent has "collectors" to receive signals before the signals are sent to the MUD. '851 at 3:34-43. In describing the invention, the specification states that the "collectors must not be processed together to create any sort of beam." *Id.*, 3:43-46. The specification distinguishes the invention from conventional receivers "that collect the signal after having been formed into a beam via conventional beamforming processing techniques." *Id.*, 3:49-53.

The specification, however, makes no mention of the MUD receiving signals with "all interference intact." And while it makes one reference to "spatial nulling" (*id.*, 5:46-48), as Collision's expert, Dr. Bertrand Hochwald, explains, in the art, terms like "spatial nulling," "adaptive nulling" and "spatial filtering" all refer to beamforming. Hochwald ¶¶62, 105, 109.

Defendants incorrectly contend that the prosecution history supports inserting "no spatial nulling" and "all interference intact" as additional requirements into the definition of "MUD." The prosecution history, however, supports Collision, not Defendants. The inventors repeatedly and consistently distinguished the invention based on only beamforming—saying, for example:

- "Applicants' invention specifically ***does not form a beam*** with the separate the

[2] These are "multiuser detect[ion/ing] unit," "[multiple user/multiuser] detector," and "MUD."

collectors." 8/20/09 OA Resp. at 12.

- "Applicants' invention specifically ***does not form a beam***." *Id.* at 15.
- "Applicants' invention ***does not form any sort of beam***, rather, ***Applicants' invention will work well because it does not first try to form beams***." *Id.* at 17.
- "Applicants' invention also ***does not form multiple different beams in space***. Applicants' invention ***does not even form one beam in space***." *Id.* at 19
- "Applicants' invention does not suffer the reduction in dimensionality because Applicants' invention ***does not perform the beamforming firs***t…." *Id.* at 21.

Defendants improperly read in a separate "spatial nulling" requirement (*see* Lanning ¶¶49, 119) pointing to the following passage from the prosecution history:

> The Thomas invention determines the required set of antenna patterns needed to spatially separate a collection of signals coming into the receiver from different transmitters. This is a scheme for ***adaptive nulling/beamforming*** in order to spatially "isolate" each received signal that originates from an individual transmitter so as not to allow the transmissions from other transmitters to enter the beam configured for the transmitter of interest.
>
> ***Applicants' invention does not form any sort of beam***, rather, Applicants' invention will work well because it does not first try to form beams. It receives all of the signals at their fullest strength, ***without trying to spatially null anything***.

8/20/09 OA Resp. at 17. But the inventors distinguished Thomas based on beamforming—not spatial nulling—and a construction here does not require that superfluous language. The inventors: described Thomas as having a beamforming scheme to isolate signals (red);[3] distinguished Thomas because the '851 invention did not beamform (green); and explained their invention "will work well" because not beamforming allows all signals to be received at full strength without trying to spatially null anything (purple). But "spatial nulling" is just another name for beamforming. *See* Hochwald ¶¶62, 105, 109, 112, 116-121. Thus, the "no spatial nulling" statement is just another way of saying the invention does not beamform, was not how Thomas was distinguished, and is not a disclaimer. *See Omega Eng'g, Inc. v. Raytek Corp.*, 334 F.3d 1314,

[3] "Adaptive nulling" is the same thing as beamforming. Hochwald ¶¶62, 105, 109.

1325-26 (Fed. Cir. 2003) (disclaimer must be "both clear and unmistakable"). The separate inclusion of "no spatial nulling" in the construction is not just unnecessary and redundant, it is likely to confuse the jury, which may conclude that "spatial nulling" and "beamforming" are two different things. *See, e.g., Sensor Elec. Tech., Inc. v. Bolb, Inc.*, 2019 WL 4645338, at *7 (N.D. Cal. Sept. 24, 2019) (declining to include both lid and cap in construction because "[c]ourts have declined to adopt constructions that include synonyms"); *Lone Star Tech. Innovations, LLC v. Asustek Comp. Inc.*, 2020 WL 6811484, at *20 (E.D. Tex. July 31, 2020) (rejecting construction as "redundant, unnecessary and may cause confusion"); *Cypress Semiconductor Corp. v. GSI Tech., Inc.*, 2014 WL 6693934, at *3 (N.D. Cal. Nov. 26, 2014) (declining to include "capture" in construction because it is "redundant" of detecting and would "confuse" the jury").

To improperly inject the "all interference intact" requirement, Defendants point to this:

> Applicants' invention does not form any patterns from the set of collected signals. ***If a beam were to be formed first, there would be no invention***. It would just be a beamformer followed by a MUD with appropriate parameter estimator, which is obvious to one skilled in the art. ***Applicants' invention also does not form multiple different beams in space. Applicants' invention does not even form one beam in space***. Applicants' invention needs to feed the MUD with the received signal from multiple collection sites, ***with all the interference intact*** and with the appropriate parameter estimates that allow the received signal model to be defined to the level that the MUD receiver requires so that it can run as it is made to do.

Lanning ¶¶50, 120 (quoting 8/20/09 OA Resp. at 19). But here too, the inventors distinguished Thomas based on beamforming—not receiving signals with "all interference intact." They again stated (green) that their invention (unlike Thomas) does not beamform, and provided (red) one of the reasons why: the invention requires that the MUD receive signals with the interference that would otherwise be removed *by* beamforming. Indeed the '851 patent discloses that some portion of the signal, including interference, may be removed by non-beamforming operations such as filtering in the preprocessing unit. '851 at 5:49-61. Thus, "all interference intact" is the expected result of not beamforming, and not the basis for distinguishing Thomas.

The inventors repeatedly and consistently distinguished Thomas based on beamforming. The statements about "no spatial nulling" and "all the interference intact" are not a clear and unmistakable disavowal, and injecting this language into the construction would be inappropriate.

B. The "parameter estimating unit(s)" terms (cls. 1, 2, 3, 9, 10, 11)[4]

Collision's Proposed Construction	Defendants' Proposed Construction
plain and ordinary meaning	"unit that estimates all values that would be required to write down the received signal equation as a summation of multiple transmitted signals, including the number of transmitted signals and any frequency offset, as well as the unique channel that each transmission went through to get to the receive antenna, and without any preordained assumptions made as to the delays on each of the possible multipaths"

The parties dispute whether the "parameter estimation unit" terms should be construed in accordance with their plain and ordinary meaning (Collision), or by importing multiple limitations into the claims (Defendants). Collision is correct. "Parameter estimating" and "parameter estimation" were well-known terms to a POSITA at the time of the '851 patent. *See, e.g.*, Ex. 12 (Ericsson '548 patent, titled "Iterative Forward-Backward ***Parameter Estimation***"); Ex. 13 (Nokia '810 patent, titled "***Parameter Estimation*** For Adaptive Antenna System"). As a jury would readily understand, parameter estimat[ing/ion] units are simply devices that perform the well-known process of estimating parameters. *See* '851 at 5:62-6:12. Plain meaning should apply. *See, e.g.*, *Thorner v. Sony Comput. Entm't Am. LLC*, 669 F.3d 1362, 1365 (Fed. Cir. 2012).

Defendants' proposed 66-word construction should not be adopted because there is neither lexicography nor clear disavowal of claim scope. *See id*. Defendants and their expert, Mr. Lanning, rely on the following statement in the prosecution history (for ease of reference, the portions of these paragraphs that appear in Defendants' construction are in red):

[4] These are "parameter estimating unit(s)" and "parameter estimation unit(s)."

> Yellin's channel estimator is forced to estimate the channel amplitude from the suboptimal measurements made by the despreader filter process. Moreover, only the channel amplitudes are estimated, one for each pre-ordained assumption of a delay (multipath).
>
> Applicants' parameter estimator estimates all values that would be required to write down the received signal equation as a summation of multiple transmitted signals, so Applicants' channel estimator needs to estimate the number of transmitted signals, as well as the unique channel that each transmission went through to get to the receive antenna. No pre-ordained assumptions are made as to the delays on each of the possible multipaths. Applicants' parameter estimator estimates any frequency offset, which the Yellin channel estimator does not.

8/20/09 OA Resp. at 10; *see also* Lanning ¶24. This is not lexicography because it provides a general description and exemplary characteristics of the parameter estimator and in no way defines a term with "reasonable clarity, deliberateness, and precision." *See In re Paulsen*, 30 F.3d 1475, 1480, 31 U.S.P.Q.2d 1671 (Fed. Cir. 1994). This statement is also not a clear and unmistakable disclaimer of claim scope, which requires "the existence of a clear and unmistakable disclaimer that would have been evident to one skilled in the art." *See Genuine Enabling Tech. LLC v. Nintendo Co., Ltd.*, 29 F.4th 1365, 1374 (Fed. Cir. 2022). Courts addressing disclaimer "consider the statements in the context of the entire prosecution. . . . If the challenged statements are ambiguous or amenable to multiple reasonable interpretations, prosecution disclaimer is not established." *Tech. Props. Ltd. LLC v. Huawei Techs. Co., Ltd.*, 849 F.3d 1349, 1357-58 (Fed. Cir. 2017). A review of the ***entire*** Office Action Response makes clear there is no disclaimer here.

The relevant part of the Response begins with a general discussion and overview of the Yellin multi-symbol detector and the inventors' invention, explaining advantages of the claimed invention and deficiencies in the prior art. 8/20/09 OA Resp. at 9-10. This discussion is untethered to the Examiner's rejection or the claims, and never mentions the Examiner, any Examiner assertions, or the specific rejections or their grounds. ***The paragraphs quoted above and relied on by Defendants are part of this general discussion***.

That overview section is then followed by a discussion of the Examiner's assertions and inventors' specific responses to each of the Examiner's assertion. *Id*. at 10-16. It follows the general structure of "Examiner asserts" or "Examiner states," followed by the inventors' response (e.g., "In response, Applicants assert…"). The language quoted above and which forms the basis of Defendants' construction is ***not*** in this portion and is not a clear and unmistakable disavowal of claim scope. *Gemstar-TV Guide Int'l, Inc. v. Int'l Trade Comm'n,* 383 F.3d 1352, 1375 (Fed. Cir. 2004) ("Gemstar's statements in the prosecution history do not indicate a disavowal or disclaimer of claim scope . . . but merely provide an example to illustrate differences between the invention and the prior art."); *Snik LLC v. Samsung Elecs. Co.*, No. 2:19-CV-00387-JRG, 2020 WL 6559685, at *9-10 (E.D. Tex. Nov. 6, 2020) (merely stating that the prior art's disclosure of certain features "did not teach the limitations in the pending claims" was not a disclaimer because "[s]uch a characterization . . . does not meet the high bar Defendants needed to establish a specific disclaimer"); *Genzyme Corp. v. Atrium Med. Corp.*, 212 F. Supp. 2d 292, 327-28 (D. Del. 2002) (finding no disclaimer where applicants stated that certain features "'appeared' to be missing from the [prior art, but] they made no statement limiting the scope of their invention").

While Mr. Lanning relies on a "note" from the inventors that makes a passing comment that a channel estimator that measures amplitudes only is not a "full parameter estimator" (Lanning ¶125 (citing 8/20/09 OA Resp. at 15)) and a statement explaining that the channel estimate should not be based on a beamformed signal (Lanning ¶126 (citing 8/20/09 OA Resp. at 21-22.)), neither statement includes the language Defendants seek to import into their construction, is definitional, or disclaims or disavows the scope of the parameter estimator.

Defendants' convoluted 66-word construction should be rejected because: it includes terms that are unclear and imprecise and that themselves require construction (e.g., "possible

multipaths," "unique channel," and "preordained assumptions"); includes a negative limitation ("without any preordained assumptions"); and is potentially confusing. *See Fractus, S.A. v. ZTE Corp.*, 2018 WL 4282783, at *30-31 (E.D. Tex. Sept. 7, 2018) (rejecting constructions of term with negative limitation as unclear, vague, and potentially confusing to a jury).

C. "Time stamp information from each independent signal receiving collector's preprocessed signal" (cl. 1)/"Time stamps provided by said at least two parameter estimation units and said at least two preprocessing units" (cl. 3)

Collision's Proposed Construction	Defendants' Proposed Construction
plain and ordinary meaning	"time stamp information at the signal collector from each independent signal receiving collector's preprocessed signal" "time stamps at respective signal collectors provided by said at least two parameter estimation units and said at least two preprocessing units"

The parties dispute whether the "time stamp" terms should be construed in accordance with their plain and ordinary meaning (Collision), or should have "at the signal collector" (or its variant) read into the claim (Defendants).[5] Collision is correct. These terms use ordinary language that will be readily understood by the jury. Defendants, in fact, do not construe any of the individual terms of these limitations. Because no disclaimer or lexicography requires the extraneous language proposed by Defendants, plain and ordinary meaning should apply.

Defendants improperly inject the phrase "at the signal collector" into the construction, lifting that phrase from a three-page discussion in the prosecution history that is neither lexicography nor disclaimer related to that phrase, but, instead, merely discusses the unimportance of precise in timing information to the invention. In particular, in response to the Examiner's assertion that it would have been obvious to combine the AAPA and Thomas because using time

[5] Plaintiff's Appendix A of the JCCS inadvertently did not include these terms. Consistent with its P.R. 4-2 constructions, Plaintiff construes these terms based on plain meaning.

stamps to determine "signals of the same time" would have been predictable, *see* 8/20/09 OA Resp. at 20-21, the inventors explained that knowing the time of the signals "is actually of no use" for their invention and that timing information needs to be only "good enough to get a good alignment" of the signals, which is "nowhere near the timing synchronization needed to do beamforming" (*id.* with the language Defendants import into their construction is shown in red):

> The use of time stamps in Applicants' invention is to know which part of the received signal at one collection site matches up with the received signal at a different collection site to allow Applicants' device to stack up portions of the received signal that coincide with the same bit or symbol. ***Knowing the time each user transmitted its bit is actually of no use***. Applicants' device needs to know when the aggregate of all transmitted signals were received ***at each signal collector*** so Applicants can stack the correct parts of the signals collected at different collectors so that they roughly line up in time so that the same bits are represented in each of the collections being stacked. . . . ***The time stamping need only be good enough to get a good alignment relative to the bit/symbols b***. ***This is nowhere near the sort of timing synchronization needed to do beamforming***.

Later, the inventors repeated the point about the unimportance of precise timing information:

> Applicants' invention also does not require the level of coordination one would require to form beams from different collectors or calculate such beamformed channel estimates. The time stamp for our invention has to be only good enough to allow us to match up the different signals collected at the different receiver so that we are bit or symbol coincident, not even chip coincident, and certainly not precisely coincident . . . as a beamformer would require."

Id. at 22. Defendants' cherry-picked language is not lexicography because it is not definitional. And is not a clear and unmistakable disclaimer because it focuses on the lower level of specificity of timing needed for the system disclosed in the '851 patent (i.e., good enough to align the signals) and not whether the timestamp information is at the collector. Indeed, the inventors never distinguished any prior art based on their "at each signal collector" statement or argued that a POSITA would not have been motivated to combine Thomas with the AAPA on this basis.

D. The Disputed Means-Plus-Function Terms are not Indefinite

The parties dispute the proper construction of four terms that are written in means-plus-

function format, pursuant to 35 U.S.C. § 112(6). For each term, the parties agree that § 112(6) applies, and they agree on the claimed function. Their only dispute is whether there is corresponding structure for each of the limitations. There is, and so these claims are not indefinite.

"A means-plus-function limitation recites a function to be performed rather than definite structure or materials for performing that function. . . . Such a limitation must be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof." *Lockheed Martin Corp. v. Space Systems/Loral, Inc.*, 324 F.3d 1308, 1318 (Fed. Cir. 2003). The specification "must disclose adequate corresponding structure to perform all of the claimed functions." *Media Rts. Techs., Inc. v. Cap. One Fin. Corp.*, 800 F.3d 1366, 1374 (Fed. Cir. 2015). Only if a court is unable to identify clearly linked corresponding structure sufficient to perform the claimed function should the claim be found indefinite. *See Noah Sys., Inc. v. Intuit Inc.*, 675 F.3d 1302, 1318 (Fed. Cir. 2012). Indefiniteness must be proved by "clear and convincing evidence" because issued patents are presumed valid. *Halliburton Energy Servs., Inc. v. M-I LLC*, 514 F.3d 1244, 1249-50 (Fed. Cir. 2008); *see also* 35 U.S.C. § 282.

1. "Means for stacking each of said parameter estimate signals" (cl. 2)

Collision's Proposed Construction	Defendants' Proposed Construction
Agreed-To Function: "stacking each of said parameter estimate signals based on a time stamp of each of said parameter estimate signals for generating a desired set of parameter estimating signals acceptable to said multiuser detector"	
Disputed Structure: processor programmed with algorithm described at 7:33-8:3.	**Disputed Structure**: no corresponding structure (Indefinite)

Contrary to Defendants' contention, this term is not indefinite for lack of sufficient structure. The '851 patent describes a "stacking unit" 354 performing the agreed-to function:

> All of the down converted sampled collected signals from the different collectors are carefully merged in unit 354 where the additional information obtained from the parameter estimation units 336, 338, and 340 are used as a guide on how to

> combine the various collections into one effective multidimensional signal, 356, and one effective parameter estimation file sent on 358, that are ultimately sent to the selected MUD processor 360.

'851 at 6:40-48. The patent says "[t]his stacking is accomplished in the stacking unit 354, which uses the time stamp information and the parameter estimation information to stack the digital received signals into a vector measurement at each time sample." *Id.*, 7:66-8:3. Stacking unit 354 is implemented in a microprocessor. *Id.*, 6:64-7:4, 8:43-56, 9:1-5. Based on these disclosures, and that the "present invention" can be implemented using a "processing unit in the base station," a POSITA, as Dr. Hochwald explains, would have understood that "stacking unit 354" (implementing the algorithm described below) is the corresponding structure and can be implemented on a programmed processor. Hochwald ¶67; '851 at 8:49-51, 9:1-12.

When describing microprocessor-implemented functions, a patent's specification must "'disclose an algorithm for performing the claimed function' on the microprocessor 'in any understandable terms including as a mathematical formula, in prose, or as a flow chart, or in any other manner that provides sufficient structure.'" *Intelligent Automation Design, LLC v. Zimmer Biomet CMF & Thoracic, LLC*, 799 F. App'x 847, 851 (Fed. Cir. 2020) (citing *Noah Sys.*, 675 F.3d at 1312). This standard is not "lofty." *In re Aoyama*, 656 F.3d 1293, 1298 (Fed. Cir. 2011). To avoid indefiniteness, the specification need disclose only enough to "permit one of ordinary skill in the art to . . . perceive the bounds of the invention." *Id.*

As the inventors explained, the "stacking" operation is "ordinary" and "trivial," and thus the steps involved would not require significant detailed disclosure to have been understood by a POSITA. *See* 8/20/09 OA Resp. at 15-16 (stacking "is an ordinary technique to collect multiple measurements together for processing" and "[k]nowing how to take and stack measurements is trivial"). Indeed, where a claimed function is simple, the disclosed corresponding algorithm can likewise be simple. *See, e.g., Intelligent Automation*, 799 F. App'x 847 at 852. Dr. Hochwald

explains (Hochwald ¶¶67-75) that the algorithm for performing the claimed function is described in the '851 patent at 7:33-8:3 and includes the following steps:

- Receive estimated parameters from parameter estimation units;
- Concatenate the received estimated parameters into a multidimensional signal matrix with a dimension equal to an integer multiple of the number of signal collectors; and
- Repeating for each time sample.

A specification discloses sufficient structure where a POSITA would understand how to apply known techniques to known structures to accomplish the claimed function. *See Alfred E. Mann Found. for Sci. Research v. Cochlear Corp.*, 841 F.3d 1334, 1345 (Fed. Cir. 2020); *Intelligent Water Solutions, LLC v. Kohler Co.*, 2017 WL 2444723, at *7-8 (E.D. Tex. 2017). Moreover, a patent provides "ample structure" when it discloses "inputs, the relationships between those inputs, and the method by which they are to be applied together." *Cellular Commc'ns Equip. LLC v. HTC Corp.*, No. 6:13-CV-507, 2015 WL 1048890, at *6 (E.D. Tex. Mar. 9, 2015).

As Dr. Hochwald explains, a POSITA would have understood that the algorithm at 7:33-8:3 discloses: inputs to the stacking ("separate sets of parameter estimates received from each collector"); output ("set of parameter estimates . . . on line 356"); and a method by which the inputs are formed into the outputs via a "stacking" process. Hochwald ¶¶36-47, 48-57, 70-73. Figure 3, moreover, illustrates the relationship between the inputs ("separate sets of parameter estimates" on lines 342, 344, and 346) and outputs ("set of parameter estimates" on line 356):

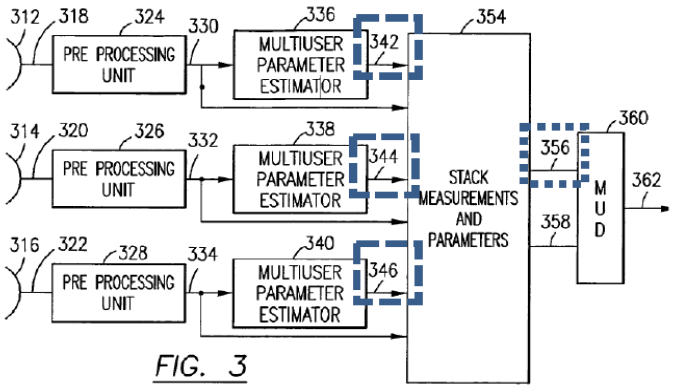

FIG. 3

The '851 specification also discloses that the parameter estimates on lines 342, 344 and 346 are stacked on each other. As Dr. Hochwald explains, a POSITA would have understood "stacking" to involve a simple well-known process called "concatenation." Hochwald ¶¶36-47, 48-57, 72-73. Dr. Hochwald's specification-annotated testimony is detailed and substantive, and more than suffices to demonstrate Defendants cannot meet their "clear and convincing evidence" burden.

Despite this evidence, Defendants argue that this term is indefinite for lack of corresponding structure because the patent fails to disclose: (a) the specific structure for "stacking unit 354"; and (b) an algorithm that performs (i) stacking of parameter estimate signals based on a time stamp, and (ii) generating a desired set of parameter estimating signals acceptable to the MUD. Lanning ¶¶59-71. But this ignores that a POSITA would have understood, based on the disclosure and in light of well-known stacking techniques, what makes up the "stacking unit 354."

Defendants' assertion that the '851 patent fails to provide structure for "stacking unit 354," showing it merely as a black "box," *see id.* ¶¶60-61, fails because Mr. Lanning ignores that a POSITA, as explained above, would have understood from the '851 patent that "stacking unit 354" may be implemented on a processor programmed with the disclosed algorithm (described above).

Defendants' contention that the patent fails to disclose a sufficient algorithm that (i) stacks parameter estimate signals based on a time stamp, and (ii) generates a desired set of parameters acceptable to said multiuser detector, *see id.* ¶¶62-64, ignores the patent's disclosure and the understanding of a POSITA. Defendants first argue that the patent describes stacking only "signals from the collectors or pre-processing units," not the required "parameter estimate signals." *See id.* ¶¶64-65, 69. But Defendants admit the patent does disclose "combin[ing] the individual separate sets of the parameter estimates" from the parameter estimating units. *Id.* ¶64. As Dr. Hochwald explains, this "combining" ***is*** the claimed "stacking" of signals. Hochwald ¶¶36-47, 48-50, 92, 94.

Defendants next assert that there is no disclosed algorithm for "stacking . . . based on a time stamp" because the time stamps are for collector signals, rather than parameter estimate signals. *See* Lanning ¶¶66, 70. But the patent describes that the stacking of parameter estimates is accomplished in stacking unit 354, which expressly uses time stamp information. *See, e.g.*, '851 at 7:62-8:3 ("Once one or more S matrices [of parameter estimates] are stacked . . . . This stacking is accomplished in the stacking unit 354, which uses the time stamp information and the parameter estimation information to stack the digital received signals . . ."). Additionally, the patent discloses that the parameter estimator determines from the collected signal a time stamp. *Id.*, 3:63-4:5. Moreover, a POSITA would have recognized this reliance on time stamps was to keep track of separate time samples of the parameter estimates. Hochwald ¶¶73-74.

Defendants also assert that a "POSITA would also expect any algorithm to specify the granularity and accuracy of the signal time stamp information needed for the supposed invention." *See* Lanning ¶66. But the specification only needs to disclose an algorithm that is sufficient to allow a POSITA to perform the specific claimed function. *Intelligent Automation Design*, 799 F. App'x at 851 (citing *Noah Sys.*, 675 F.3d at 1312); *In re Aoyama*, 656 F.3d at 1298. Where, as here, the specification discloses an algorithm, "the question is whether the disclosed algorithm, from the viewpoint of a person of ordinary skill, is sufficient to define the structure and make the bounds of the claim understandable." *Noah Sys.*, 675 F.3d at 1313. Nothing in the recited function, or in the overall patent, suggests any particular level of granularity is required for the time stamps, and Defendants identify no evidence that such detail is necessary. *See* Lanning ¶66. Indeed for a simple algorithm like this one, no particular "accuracy" would be required for it to be understood.

Defendants next contend that the patent does not disclose an algorithm that performs "generating a desired set of parameter estimating signals acceptable to said multiuser detector."

Lanning ¶¶67, 71. But as Dr. Hochwald explains, a POSITA would have understood that the '851 patent discloses that the stacked parameter estimates 356 output from the stacking unit 354 are provided to the MUD in a multidimensional space, which is subsequently used by the MUD. *See* Hochwald ¶¶70-71. For that to occur, they must be "acceptable" to the MUD.

Finally, Defendants argue that the patent fails to disclose "generating a desired set of parameter estimating signals" because "the sets of parameter estimates are distinct from the set of parameter estimating signals." Lanning, ¶67. But there is no support for Defendants' suggestion that the claimed "parameter estimating signals" must be something more than a stacked combination of the parameter estimating signals received from the first and second parameter estimating units. The patent's description of the stacking operation makes clear that a simple concatenation process in which the parameter estimates are stacked on top of each other is all that is required. *See* Hochwald, ¶72; '851 at 6:40-48, 7:19-41.

Because the '851 patent provides sufficient structure to implement the claimed function, the claim is not indefinite, and should be construed as Collision proposes.

2. The "means for including" limitations (cls. 9 and 11)[6]

Collision's Proposed Construction	Defendants' Proposed Construction
Agreed-To Function: "including at least two matrices based on signals received from each signal collector, each due to a different collection site of each said collector, stacked upon each other to create a new signal matrix" / "including at least two matrices based on signals received from said first collector and said second collector, stacked upon each other, each due to a different collection site of said first collector and said second collector"	
Disputed Structure: processor programmed with algorithm described at 7:33-8:3.	**Disputed Structure**: no corresponding structure (Indefinite)

[6] These terms are: "means for including at least two matrices based on signals received from each signal collector, each due to a different collection site of each said collector, stacked upon each other to create a new signal matrix" (cl. 9) and "means for including at least two matrices based on signals received from said first collector and said second collector, stacked upon each other, each due to a different collection site of said first collector and said second collector" (cl. 11).

These claim terms, too, are not indefinite for lack of sufficient structure, as the '851 patent discloses that the agreed-to functions are performed by a processor programmed with the algorithm set forth in 7:33-8:3. *See also* Hochwald ¶77.

As discussed above, the '851 patent discloses that the stacking of parameter estimates is performed by a processor implementing the algorithm described at 7:33-8:3. *See* Hochwald ¶¶67, 82; '851 at 9:1-12. Based on the intrinsic record, a POSITA would have understood the claim's "new signal matrix" to be stacked parameter estimates. *See* '851 at 7:53-55 (explaining "signal matrix" is obtained by stacking "original S matrices"); 8/20/09 OA Resp. at 13 (explaining that matrix S is "the model for the stacked received signal," as opposed to the received signals themselves); Hochwald ¶¶77, 82. Defendants' argument that the patent does not sufficiently describe a processor for the claimed "including at least two matrices …" (*see* Lanning ¶¶99, 107) fails because, as discussed above, a POSITA would have understood that the patent discloses a simple algorithm (receiving the parameter estimations from the parameter estimators in the form of matrices and concatenating these into a higher ranked matrix), which can be implemented using a programmed "processing unit" in the base station. '851 at 8:49-51, 9:1-12; *see also* Hochwald ¶¶67, 74, 79. Defendants' argument that the algorithm is insufficient (Lanning ¶¶88-95) fails because a POSITA would have understood that the claimed stacking is accomplished through this simple, well-known concatenation procedure. '851 at 7:33-8:3; Hochwald, ¶¶39, 79, 85.

3. "Means for stacking said received signals" (cl. 10)

Collision's Proposed Construction	Defendants' Proposed Construction
Agreed-To Function: "stacking said received signals based on a time stamp of said signals and a set of parameters corresponding to each of the transmitted signals as received at each of the signal collectors"	
Disputed Structure: processor programmed with algorithm described at 7:26-8:3.	**Disputed Structure**: no corresponding structure (Indefinite)

This term is also not indefinite for lack of sufficient structure. The agreed-to function is performed by a processor programmed with the algorithm described at 7:26-8:3. '851 at 8:49-51, 9:1-12; Hochwald ¶67. As Dr. Hochwald explains, a POSITA would have understood the function to require an algorithm with these specific steps:

- Receive estimated parameters from parameter estimation units;
- Concatenate the received estimated parameters into a multidimensional signal matrix with a dimension equal to an integer multiple of the number of signal collectors;
- Receive measurements from the collectors;
- Concatenate the received measurements into a vector measurement; and
- Repeating the above steps for each time sample.

Hochwald ¶96. In the context of the '851 patent, a POSITA would have further understood that the algorithm at 7:26-8:3 discloses inputs to the stacking related to the measurements (330, 332, 334) and corresponding output ("vector measurement" on line 358), and method by which the inputs are formed into the outputs via a "stacking" process. Hochwald ¶¶92-94. An algorithm provides sufficient structure where, as here, it discloses "inputs, the relationships between those inputs, and the method by which they are to be applied together." *Cellular Commc'ns Equip.*, 2015 WL 1048890, at *6. Figure 3, annotated below, illustrates this relationship between these input measurements (e.g., 330, 332, 334) and outputs (e.g., 358):

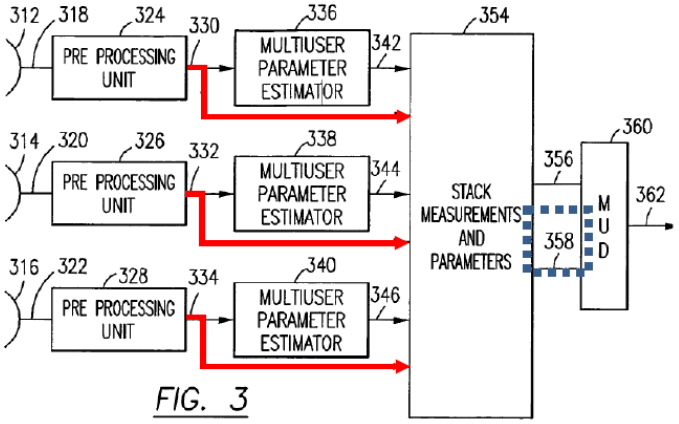

FIG. 3

The specific algorithm discloses that "stacking is accomplished in the stacking unit 354, which uses the time stamp information . . . to stack the digital received signals into a vector measurement at each time sample." '851 at 7:66-8:3. As Dr. Hochwald explains, a POSITA would have understood that stacking of measurements, similar to stacking of parameter estimates, is done through concatenation. Hochwald ¶¶90-96. And, as discussed in Section I.D.1, the patent discloses that its stacking of parameter estimates involves concatenating the separate sets of received parameter estimates into a set of parameter estimates for output to the MUD on line 356.

As with the other "means for stacking . . ." limitation, Defendants' argument that the patent discloses a mere black box for stacking unit 354 (*see* Lanning ¶¶86-87) fails because, as discussed above, a POSITA reading the patent would have known (from a disclosure Mr. Lanning never addresses) that this component is implemented using a processor programmed with the algorithm described above. *See* '851 at 8:49-51, 9:1-12; Hochwald ¶67. Defendants' contention that any disclosed algorithm is insufficiently detailed (Lanning ¶¶88-94) similarly fails because, as discussed above (*see* Section I.D.1), "stacking" was a well-known operation. Moreover, the patent specifically discloses that a set of values from the respective antennas (e.g., two from each of three antennas) are concatenated to provide a measurement vector (e.g., of dimension 6). *See* '851 at 7:27-33; Hochwald ¶94. Because concatenation is a simple, straightforward process, a POSITA would have understood the disclosed algorithm. *See Noah Sys.*, 675 F.3d at 1313.

Finally, Defendants' expert argues without merit that the patent does not disclose how the stacking is performed "based on a time stamp of said signals." *See* Lanning, ¶94. In essence, he repeats his position that a POSITA would expect disclosure specifying the accuracy of the signal time stamp information—and the absence of such a discussion renders the term indefinite. But, again, nothing in the recited function requires such a high level of precision. And for simple, well-

known operations like stacking, no such specificity is required. *Noah Sys.*, 675 F.3d at 1313; *Cellular Commc'ns Equip.*, No. 2015 WL 1048890, at *6.

E. "A stacking device for stacking measurements and combining parameters between each of said parameter estimating units" (cl. 3)

Collision's Proposed Construction	Defendants' Proposed Construction
Plain and ordinary meaning. To the extent that this term is subject to § 112(6): **Function**: "stacking measurements and combining parameters between each of said parameter estimating units" **Structure**: processor programmed with algorithm described at 7:26-8:3.	**Function**: "stacking measurements and combining parameters between each of said parameter estimating units" **Structure**: no corresponding structure (Indefinite)

The parties first dispute whether § 112(6) applies. If it does, they further dispute whether there is sufficient corresponding structure disclosed in the '851 patent. Here, the term is not subject to § 112(6)—and, if it is, there is sufficient corresponding structure and the term is not indefinite.

Unlike in the prior terms, the inventors chose not to utilize "means for" language in this claim element, so it is presumed that § 112(6) does not apply. *See Dyfan, LLC v. Target Corp.*, 28 F.4th 1360, 1369 (Fed. Cir. 2022) ("[W]e presume that a claim limitation is not drafted in means-plus-function format in the absence of the term 'means.'"). Defendants cannot overcome this presumption because the claim term recites sufficiently definite structure. *Id.*

In the context of the patent, a POSITA would have understood "stacking device" to be a well-known device that performs a concatenation operation on matrices and vectors. *See* Hochwald ¶¶36-67, 100. As the inventors confirmed during prosecution, the operation of "stacking" was "ordinary" and "trivial," and thus would have been well understood by a POSITA.

See 8/20/09 OA Resp. at 15-16; Hochwald ¶¶36-67, 100.[7] In such circumstances, where a claimed device is well-known to a POSITA and implements ordinary and trivial operations, it confers sufficient structure. *See Power Integrations, Inc. v. Fairchild Semiconductor Intern., Inc.*, 711 F.3d 1348, 1365 (Fed. Cir. 2013) (finding § 112(6) does not apply where the claimed circuit "performs a straightforward function" and POSITA would have understood that the claim designated sufficiently definite structure).

Defendants miss the mark in arguing that "device" in this claim term is a mere nonce word because the disputed term is "***stacking*** device." *See* Lanning, ¶75. Courts in this district have determined that terms with a combination of an adjective describing a well-known operation and "device" are sufficient to connote structure. *See, e.g., Invensys Sys., Inc. v. Emerson Elec. Co.*, 63 F. Supp. 3d 663, 672 (E.D. Tex. 2014) ("processing device" not a means plus function term); *Blue Spike, LLC v. Texas Instruments, Inc.*, No. 6:12-CV-499-MHS-CMC, 2014 WL 5299320 at *20 (E.D. Tex. Oct. 16, 2014) *objections overruled*, 2015 WL 12911327 (E.D. Tex. June 24, 2015) ("Contrary to Defendants' contention, the Court finds that the claims do not nakedly recite a 'device.' Instead, the claims recite a 'comparing device' that 'compares' or a 'device configured to compare.'"). Because "stacking" is a simple, well-understood process, a POSITA would have understood a "stacking device" to connote sufficient structure, such that § 112(6) does not apply.

To the extent § 112(6) is found to apply, for all the reasons provided above with respect to the term "means for stacking said received signals" (*see* Section I.D.3), the disclosed corresponding structure of a processor programmed with the algorithm described at 7:26-8:3, is sufficient structure such that the claim is not indefinite. *See* Hochwald ¶¶101-103.

[7] The literature supports this common understanding. *See* Ex. 15 (MATLAB Array Manipulation) at .21 ("The third line above builds a 2D matrix which is a vertical concatenation (stacking) of all 2D slices."); Ex. 16 (Am. Heritage Dictionary) at 1345 ("stacking" means "to arrange in a stack").

II. THE '479 AND '561 PATENTS

The '479 and '561 patents share a common specification and are directed generally to improving operating efficiency of a base station in a cellular communications network. The patents accomplish this by measuring background interference levels due in part to the signals generated in neighboring cells, and then transmitting to user equipment in the cell operating parameters that are selected according to the measured background interference to provide acceptable quality of service and to optimize use of available bandwidth.

A. "[determining/determine] revised operating parameters for the [first/second] UE that minimize changes to" ('479 cls. 1, 12, 23; '561 cls. 1, 13, 25)

Collision's Proposed Construction	Defendants' Proposed Construction
plain and ordinary meaning	"[determining/determine] revised operating parameters for the [first/second] UE that result in the smallest possible change to"

The parties dispute whether "minimize" in these larger terms should be afforded its plain and ordinary meaning (Collision) or should be required to "result in the smallest possible" (Defendants). In fact, "minimize"—a term that the jury will readily understand—is used in the claims in its plain and ordinary sense, and does not require construction.

The claimed operating parameters are revised to minimize changes to the background interference levels received by a base station. *See, e.g.*, claim 1 of the '479 and '561 patents. The specification confirms that "minimize" is used in accordance with its plain, everyday meaning (i.e., to have little or no effect):

- Operating parameters are changed to "***have little or no effect on background interference*** in neighboring cells, for example by minimizing changes to the power levels, frequencies, time slots, and spreading codes used by the user equipment, thereby ***minimizing fluctuations of background interference levels 206.***" '561 at 6:6-19.
- "On the other hand, some operating parameters have ***little or no effect on background interference in neighboring cells***." *Id.*, 6:32-37.

- "Accordingly, if a group of neighboring base stations all revise their operating parameters according to base station operating rules that specify a preference for changing only those parameters that have ***minimal effect on background interference***…." *Id.*, 6:38-46.
- "Embodiments improve the accuracy of Signal to Interference and Noise ("SINR") predictions made by the base stations ("BS's") by ***reducing the fluctuation of the background interference***…." *Id.*, 5:67-4:5.

Given the plain meaning of this commonly used term, as well as these disclosures, there is no need to construe "minimize" further. It is used in its ordinary sense, in a way that will be readily understood by the jury. Where an inventor does not redefine a term or clearly disavow its scope, plain and ordinary meaning should govern. *Thorner*, 669 F.3d at 1365; *see also Bradium Techs. LLC v. Iancu*, 923 F.3d 1032, 1044 (Fed. Cir. 2019).

There is no lexicography or disclaimer here. Nothing in the patent or prosecution history evidences a clear intent to define "minimize" differently from plain and ordinary meaning with the "reasonable clarity, deliberateness, and precision" lexicography demands. *In re Paulsen*, 30 F.3d at 1475. And while Defendants' expert notes that "minimize" was discussed during prosecution (Mahon ¶¶75-79), those discussions focused on the difference between minimizing ***changes to interference levels*** versus minimizing ***interference levels***—not on the meaning of "minimizing."

Defendants' construction should also be rejected because the phrase "the smallest possible change" injects ambiguity and could potentially confuse the jury. What makes a change "possible"? And what exactly is the ***smallest possible*** change? Zero? Slightly more than zero? How much more? By contrast, the jury is more than capable of understanding "minimize."

II. THE '620 PATENT

The '620 patent, titled "Bandwidth-Efficient Wireless Network Modem," is directed to addressing problems in a multi-user and multi-channel wireless network associated with channel allocation. The patent's inventions are directed to improving efficiency by "considering the interference and noise environment" when assigning users to allocated channels. '620 at 4:1-11.

In particular, the inventions determine the signal-to-noise ratio in a channel, and whether there is sufficient noise margin to add additional users to the channel. The channels are dynamically allocated accordingly, improving the efficiency of the wireless network.

A. "Each of one or more interfering signals" (cl. 1)

Collision's Proposed Construction	Defendants' Proposed Construction
plain and ordinary meaning	"all interfering signals"

The parties dispute whether the "each of one or more interfering signals" term should be accorded its plain and ordinary meaning (Collision), or whether "all interfering signals" should be inserted into the construction (Defendants). Collision is correct.

This term is part of a larger claim phrase: "a digital signal processor for reconstructing an estimate of ***each of one or more interfering signals*** . . ." This phrase means exactly what it says—an estimate is reconstructed for each in a set (e.g., "one or more") of interfering signals. Feuerstein ¶ 38; *see also Lava Trading, Inc. v. Sonic Trading Mgmt., LLC*, 445 F.3d 1348, 1354 (Fed. Cir. 2006) ("By selecting the word 'a' instead of 'all,' the Applicant set forth a method wherein the traders may request and receive information for only a subset of the securities (i.e., one or more)."). Thus, if there are 3 interfering signals in the relevant set of signals, 3 separate estimates are reconstructed. This interpretation is consistent with the specification. Feuerstein ¶39; '620 at 5:17-21 ("a digital signal processor for reconstructing an estimate of ***each*** interfering signal"), 10:38-42 ("Using the bit value estimates from the joint detector 80 and parameter estimates from the synchronizing element 82, the bit processing computer 70 reconstructs an estimate of ***each*** interfering signal."); *see also id.*, 3:58-61, 10:36-42.

Defendants' construction contradicts the specification, changes the meaning of the term, and creates ambiguity. Substituting Defendants' proposed language into the larger claim phrase results in: "reconstructing an estimate of ***all*** interfering signals and calculating a noise power."

Here, "all" could mean that one single estimate is generated for a combination of all interfering signals. Returning to the 3-signal example above, this would mean reconstructing a single estimate from a combination of the three signals. This interpretation contradicts the plain language, finds no support in the intrinsic record, and contradicts the express teachings in the specification. *See* '620 at 10:36-59; Feuerstein ¶40.

"All" could also mean "each and every": "reconstructing an estimate of ***each and every*** interfering signal[] and calculating a noise power." *See* Feuerstein ¶41. This reading contradicts the plain language of the claim (which refers to "each of one or more"). Under the plain language, the limitation could apply to a subset of interfering signals within a larger group of interfering signals. *See, e.g.*, *Bio-Rad Labs., Inc. v. 10X Genomics, Inc.*, 322 F. Supp. 3d 537, 545 (D. Del. 2018) (distinguishing "each" from "each and every": "'[e]ach' refers only to the plugs and plug fluids in the claim at issue and not plugs and plug fluids generally"). If all interfering signals must be estimated, this would encompass interfering signals in the network having nothing to do with the '620 invention. Feuerstein ¶42. This conflicts with the patent's statement that "the present invention applies to ***any number*** of interfering digital signals on the same channel"—not to ***all*** interfering signals on ***every*** channel. *Id.*; *see also* '620 at 3:58-61, 9:17-22, 10:8-13, 10:36-42.

Defendants miss the mark by relying on the following statement in the prosecution history to support their construction: "However, there is certainly no description [in the Liu reference] of reconstructing all signals and all interfering signals as described in the present application." Ex. 7 (9/21/06 OA Resp.) at 9. This remark was not made with respect to the "a digital signal processor for reconstructing an estimate of each of one or more interfering signals" limitation, but with respect to an amendment to the "baseband waveform processor" limitation. *Id*. at 3. The inventor, moreover, explained that this amendment was made "to clarify one of the embodiments of the

invention" (*id*. at 8), and that the Examiner noted the additional language in the amended claim (not pertaining to reconstructing estimates of interfering signals) was "allowable subject matter" that is "not described in Liu." *Id*. at 9. The Examiner indisputably did not rely on inventor's statement to traverse the prior art. Collectively, this does not evidence a "clear and unmistakable" intent to disavow claim scope or otherwise change the plain meaning of "each of one or more interfering signals." *See Baxalta Inc. v. Genentech, Inc.*, 972 F.3d 1341, 1348 (Fed. Cir. 2020); *Ecolab, Inc. v. FMC Corp.*, 569 F.3d 1335, 1342 (Fed. Cir. 2009) ("Even if an isolated statement appears to disclaim subject matter, the prosecution history as a whole may demonstrate that the patentee committed no clear and unmistakable disclaimer."); *see also* Feuerstein ¶42-43.

III. THE '492 PATENT

The '492 patent is generally directed to addressing problems associated with multi-user detection within a multi-user wireless network. The patent explains that existing systems were not able to keep up with real-time transmissions or had poor quality output when there were many users or too much interference. *See, e.g.*, '492 at 4:48-5:4, 6:43-63 (high complexity MUDs might "require too many computations to keep up with real time transmissions," while faster, lower-complexity MUDs could have "poor quality output when there are many or strongly correlated interferers or users."). The inventions of the '492 patent address these problems by using a decision unit to select, for a given situation based on a set of decision criteria, either slower but higher complexity MUDs or faster, low-complexity MUDs.

A. "multi-user detector decision unit using decision criteria to determine a selected multi-user detector" (cl. 1)

Collision's Proposed Construction	Defendants' Proposed Construction
Plain and ordinary meaning. If this term is subject to § 112(6): Function: "using decision criteria to determine a	Means-plus-function Function: "using decision criteria to determine a selected multi-user detector" Structure: processor with algorithms as

selected multi-user detector" Structure: Decision logic components with any of the algorithms described at 8:12-18, 13:35-14:40, 15:3-15:21, 19:43-48, 19:56-62, 20:41-49.	described in 8:12-18, 13:35-44, 13:55-57, 13:63-65, 14:7-9, 14:19-23, 14:32-40

The parties dispute whether § 112(6) applies, and, if it does, what the corresponding structure is. This is not a means-plus-function element and plain meaning should apply. If the Court finds that the term is subject to § 112(6), the Court should adopt Collision's structure.

(a) Defendants Cannot Rebut the Presumption Against § 112(6)

Because the inventor chose not to utilize "means for" language in this claim element, it is presumed that § 112(6) does not apply. *See Dyfan*, 28 F.4th at 1369. Defendants cannot overcome this presumption because the claim term connotes sufficient structure. *See id.*

Here, as Collision's expert, Dr. Feuerstein, explains, "multi-user detector decision unit" connotes a definite hardware structure to a POSITA—a decision logic unit that decides what multi-user detector to use. Feuerstein ¶¶45-46. Indeed, the '492 patent confirms that "decision logic" or a "decision unit" selects which MUD to use. *See, e.g.*, '492 at 18:1-2 ("Based upon the ***decision logic***, the MUD is chosen 320 for the particular window of data."), 19:24-25 ("The ***decision logic*** unit 520 selects which MUD to use based on certain metrics . . ."), 14:33-35 ("Inside the turbo loop, a decision is made by the ***MUD decision unit*** 220 as to which MUD decoder to use based on certain criteria."). Decision logic was well understood by POSITAs as being implemented with computer circuitry and following an algorithm or series of instructions for selecting among options. Feuerstein ¶47. In the context of the '492 patent, a "multi-user detector decision unit" is specific decision logic circuitry that reads a set of inputs and selects among different MUDs based on those inputs and, accordingly, is not simply a generic processor. *See id.*

The claim language itself confirms that § 112(6) does not apply. The "multi-user detector decision unit" is first introduced in claim 1 without a function but with structural connections:

> a multi-user detector decision unit ***coupled to*** said parameter estimator and said received signals;
>
> at least two multi-user detectors ***coupled to*** said parameter estimator and said multi-user detector decision unit, . . .

The lack of the term "means" or any recited function, but instead with structural connections, all strongly militate against applying § 112(6). *See Rembrandt Techs., L.P. v. Comcast Corp.*, 512 F. Supp. 2d 749, 759 (E.D. Tex. 2007) ("[a] limitation [that] does not recite any function . . . is outside the scope of § 112 ¶ 6"); *Inventio AG v. ThyssenKrupp Elevator Americas Corp.*, 649 F.3d 1350, 1359-60 (Fed. Cir. 2011) ("modernizing device" not § 112(6) because the claims "delineate the components that the modernizing device is connected to, describe how the modernizing device interacts with those components, and describe the processing that the modernizing device performs"). The use of the descriptive adjective "multi-user detector decision" in front of "unit" is another indicator that § 112(6) does not apply. *See Apex Inc. v. Raritan Computer, Inc.*, 325 F.3d 1364, 373 (Fed. Cir. 2003) ("circuit" coupled with identifiers such as "interface," "programming," and "logic" connoted sufficient structure to a person of ordinary skill in the art); *see also Blue Spike*, 2014 WL 5299320 at *20 (E.D. Tex. Oct. 16, 2014) *objections overruled*, No. 6:12-CV-499-MHS-CMC, 2015 WL 12911327 (E.D. Tex. June 24, 2015) ("comparing device" not § 112(6)); *Invensys Sys.*, 63 F. Supp. 3d at 671 ("processing device" not § 112(6)).

The specification, additionally, provides such a detailed description of the "multi-user detector decision unit" and its operation that a POSITA would have recognized the term to connote sufficient structure. Feuerstein ¶¶48-53; *see also Apple Inc. v. Motorola, Inc.*, 757 F.3d 1286, 1301 (Fed. Cir. 2014) (finding "heuristic" did not invoke § 112(6) because "the claim language and specification disclose the heuristics' operation within the context of the invention, including the inputs, outputs, and how certain outputs are achieved"). Here, as in claim 1, the specification recites that the "multiuser detector decision unit" is coupled to a parameter estimator, the received

signals, and at least two different MUDs that are "switchably coupled" to the decision unit. '492 at 7:13-16, 7:54-63. The specification also describes in detail the inputs to the decision unit and its operation. *Id.*, 8:7-11, 13:2-3, 13:33-47, 14:38-40, 14:56-15:5, 15:22-35, 19:24-55, 20:29-49, 21:6-14. Notably, this Court previously found similar terms (e.g., control unit and determination unit) not to be § 112(6). *See, e.g., Cellular Commc'ns. Equip. LLC v. HTC Corp.*, No. 6:16-CV-475-KNM, 2018 WL 316472, at *15 (E.D. Tex. Jan. 8, 2018) ("control unit" not § 112(6) because the control unit's objectives and how it operated within the context of the claimed invention were recited in the claim language); *OPTIS Wireless Tech. LLC v. ZTE Corp.*, No. 2:15-CV-300-JRG-RSP, 2016 WL 1599478, at *26 (E.D. Tex. Apr. 20, 2016) ("[D]isclosure of the objectives of the 'determination unit' and how the unit operates within the context of the claimed invention connotes sufficiently definite structure to one of skill in the art.").

(b) If § 112(6) Applies, Collision's Corresponding Structure is Correct

If this term is subject to § 112(6), Collision's proposed corresponding structure is correct because it is linked to the claimed function and incorporates all disclosed structures capable of performing the function. *See, e.g., Creo Prods., Inc. v. Presstek, Inc.*, 305 F.3d 1337, 1346 (Fed. Cir. 2002) ("[D]isclosed structure includes that which is described in a patent specification, including any alternative structures identified.").

The corresponding structure is "decision logic components," and is not limited to a generic processor (Defendants). Limiting the physical structure to a generic "processor" fails to account for the specification's disclosure that "decision logic unit 520" (or "MUD decision unit 220") performs the function of selecting the MUD based on decision criteria. *See e.g.*, '492 at 13:33-35, 19:19-24. Accordingly, a POSITA would have understood that a "logic unit" is "a part of a computer that performs logic operations and related operations." *See* Feuerstein ¶47; Ex. 14 (IEEE Dictionary) at 602. As Dr. Feuerstein explains, decision logic can be implemented not just in a

processor (which is how Defendants improperly limit the claim), but also in other hardware devices, such as Complex Programmable Logic Devices (CPLDs), Field Programmable Gate Arrays (FPGAs), baseband ICs, and other discrete logic components. Feuerstein ¶55.

Defendants' construction also improperly narrows the limitation, requiring that the corresponding structure be programmed with ***all*** of the disclosed algorithms. When multiple alternative structures are disclosed, sufficient corresponding structure includes any one disclosed structure that performs the claimed function. *See, e.g.*, *Creo Prods.*, 305 F.3d at 1345 ("Nothing in the patent requires a single structural embodiment . . . in original claim 1 to be capable of performing all four of the [alternative] algorithms disclosed."). Only one of the algorithms identified by either Collision or Defendants is required to perform the claimed function of "using decision criteria to determine a selected multi-user detector." *See id.*; Feuerstein ¶¶ 57-58.

Finally, Defendants' structure is incomplete because Defendants ignore the disclosed algorithm for determining which MUD to use based on the structure of the eigenvalues. '492 at 20:41-49 ("If one or more users have an expected BER below a certain threshold, then [the simplest] that MUD is selected, otherwise the expected BER across all users is processed for the next simplest MUD."); *see also id*, 15:3-21, 19:43-48, and 19:56-62; Feuerstein ¶¶59-61.

B. "said design criteria" (cl. 3)

Collision's Proposed Construction	Defendants' Proposed Construction
"said decision criteria"	Indefinite

As Collision maintains, "said design criteria" should be construed as "said decision criteria," based on a typographical error.

A court can correct a patent if, as here: (1) "the correction is not subject to reasonable debate to one of ordinary skill in the art" in view of the "claim language and the specification;" and (2) "the prosecution history does not suggest a different interpretation of the claims." *Ultimax*

Cement Mfg. Corp. v. CTS Cement Mfg. Corp., 587 F. 3d 1339, 1353 (Fed. Cir. 2009). If the claim includes a typographical error, a court can fix the error through claim construction. *Id.*

Claim 3 of the '492 patent is set forth below:

> 3. The System ***according to claim 1 wherein said design criteria*** is based upon at least one threshold selected from at least one of the group consisting of number of symbols, correlation matrix between users, expected bit error rate, eigendecomposition of correlation matrix, signal to interference plus noise ratio, and expected SINR.

While "design criteria" is not a term in claim 1 (claim 3's parent), "***decision*** criteria" is:

> at least two multi-user detectors coupled to said parameter estimator and said multi-user detector decision unit, said multi-user detector decision unit ***using decision criteria*** to determine a selected multi-user detector, wherein said selected multi-user detector outputs a plurality of information streams, one stream corresponding to each of said received signals; . . .

'492 at claim 1. Here the presence of "decision criteria" in claim 1 provides the antecedence for "said design criteria," and renders the scope of claim 3 readily and reasonably ascertainable to a POSITA. As Dr. Feuerstein explains: "A POSITA easily would have realized . . . that 'said design criteria' in claim 3 must refer to 'decision criteria' in claim 1 because 'decision criteria' is the only term in claim 1 with reference to any 'criteria' (i.e., the only instance of 'criteria' in claim 1 is with respect to 'decision criteria'), and is the only interpretation that makes any sense of claim 3." Feuerstein ¶67. Dr. Feuerstein further confirms that "[t]he same POSITA thus would have understood that the phrase "wherein said design criteria" in claim 3 contains a typo, since the term "design criteria" is absent from claim 1, and should instead be "wherein said decision criteria." *Id.* Because "design criteria" in claim 3 refers to "decision criteria," the claim is not indefinite.

Respectfully submitted,

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CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the above and foregoing document has been served on May 26, 2022, to all counsel of record who are deemed to have consented to electronic service via the Court's CM/ECF system per Local Rule CV-5(a)(3).

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